

**WHAT IS CLAIMED IS:**

Suba 17 1. An intraluminal catheter having a component having at least one radiopaque marker, the radiopaque marker comprising;

a) a first layer of radiopaque material; and

5 b) a second layer of radiopaque material on the first layer, having a thickness greater than a thickness of the first layer.

10 2. The catheter of claim 1 wherein the first layer of radiopaque material comprises a deposited layer of radiopaque material on an outer surface of the catheter component, and the second layer of radiopaque material comprises an electroplated layer of radiopaque material on an outer surface of the first layer of radiopaque material.

15 3. The catheter of claim 1 wherein the second layer of radiopaque material extends the entire length of the first layer.

4. The catheter of claim 1 wherein the first and second layers of radiopaque material are formed of the same radiopaque material.

20 5. The catheter of claim 1 wherein the first layer of radiopaque material has a smaller particle size than the second layer of radiopaque material.

6. The catheter of claim 1 wherein the first layer of radiopaque material comprises a first radiopaque material and the second layer of radiopaque material comprises a second radiopaque material different from  
5 the first radiopaque material.

7. The catheter of claim 1 wherein the first layer of radiopaque material comprises a blend of a polymeric material and a radiopaque material.

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8. The catheter of claim 7 wherein the second layer comprises an electroplated layer of radiopaque material on the blended first layer.

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9. The catheter of claim 7 wherein the catheter component comprises a first section longitudinally spaced from a second section adjacent thereto, and the first layer of radiopaque material is joined to and extends between the longitudinally spaced sections.

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10. The catheter of claim 1 wherein the catheter component is a catheter shaft.

11. The catheter of claim 1 wherein the catheter component is an

inflatable balloon.

12. The catheter of claim 11 having a distal radiopaque marker at a distal end of a working length of the balloon and a proximal radiopaque marker at a proximal end of the working length of the balloon, the proximal and distal radiopaque markers each comprising a first layer of radiopaque material, and a second layer of radiopaque material on the first layer having a thickness greater than a thickness of the first layer.

10 13. The catheter of claim 11 wherein each of the distal and proximal radiopaque markers have a length substantially less than a length of a working length of the balloon.

15 14. The catheter of claim 1 wherein the thickness of the first layer is about 0.001 mm to about 0.01 mm.

15. The catheter of claim 1 wherein the thickness of the second layer is about 0.02 mm to about 0.025 mm.

20 16. The catheter of claim 1 wherein the second layer has a length of about 0.05 mm to about 1.5 mm.

17 A balloon catheter, comprising

- a) an elongated catheter shaft, having a proximal end, a distal end, and a lumen;
- b) a balloon on a distal section of the catheter shaft, having
- 5 a working length; and
- c) at least one radiopaque marker on a surface of the working length of the balloon, having a length substantially less than a length of the working length of the balloon.

10 18. The balloon catheter of claim 17 wherein the at least one radiopaque marker comprises at least one of a distal radiopaque marker on an outer surface of the balloon at a distal end of the working length of the balloon and a proximal radiopaque marker on the balloon outer surface at a proximal end of the working length of the balloon, the distal and proximal

15 radiopaque markers comprising a first layer of radiopaque material, and a second layer of radiopaque material on the first layer having a thickness greater than a thickness of the first layer.

Sub 937 19. A method of making a radiopaque marker for a catheter

20 component, comprising

- a) depositing a first layer of radiopaque material onto at least a section of the catheter component; and

b) electroplating a second layer of radiopaque material onto an outer surface of the first layer of radiopaque material.

5 20. The method of claim 19 including depositing the first layer by thin film deposition.

21. The method of claim 19 wherein the first layer is deposited by a thin film deposition technique selected from the group consisting of chemical vapor deposition and physical vapor deposition.

10 22. The method of claim 19 including depositing the first layer of radiopaque material onto a section of the catheter component having a length substantially less than a length of the catheter component.

15 23. The method of claim 19 wherein the catheter component is a balloon and including electroplating onto the first layer a thicker layer of radiopaque material than the first layer of radiopaque material, to form the second layer.

20 24. The method of claim 29 wherein the catheter component is a catheter shaft and including electroplating onto the first layer a thicker layer of radiopaque material than the first layer of radiopaque material, to form

the second layer.

32 25. The method of claim 19 wherein depositing the first layer comprises depositing a layer having a thickness of about 0.001 mm to about 0.01 mm, and electroplating the second layer comprises electroplating a layer having a thickness of about 0.2 mm to about 0.025 mm.

10 26. A method of making a radiopaque marker for a catheter component, comprising

a) electroplating a layer of radiopaque material onto an outer surface of at least a section of a catheter component, the section of the catheter component comprising a blend of a polymeric material and a radiopaque material.

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